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10/24/2003

Qing Yang

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11/21/2005

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EXAMINER

DINH, NGOC V.

ART UNIT

PAPER NUMBER

2189

DATE MAILED: 11/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/693,077 | YANG, QING | |
| | Examiner | Art Unit | |
| | NGOC V. DINH | 2189 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to amendment filed 09/26/05 due to the Non-Responsive Office Action filed 05/18/05 by the Examiner. In this instant amendment, the Applicant submitted the correction to cancel claims 1-24 and add new claims 25-46 for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 25-46 are rejected under 35 U.S.C.102 (e) as being anticipated by Brant et al. US PUB. 2003/0159082.

Brant teaches:

Per claim 25:

An information backup system [RAID storage systems accomplish this by distributing redundant copies of data across multiple storage devices, [0007]; fig. 1; mirrored device [0053] comprising:
a plurality of computer systems [number of host computer, [0004]];
communication network [SAN environment, [0055]] to which at least some of said computer systems are communicatively coupled [fig. 8];
a functionally coherent and physically distributed cache memory [cache220, [0046]] comprising a plurality of memory portions each within a memory of a computer system among a first set of said computer systems [cache coherency processing, [0021], [0047]; and
a functionally coherent and physically distributed data storage device [a mirrored drive 716 in effect creates a redundant data drive for each data drive 712, 714, [0053]] comprising a plurality of data storage portions each within a data storage device of a computer system among said first set of computer systems, at least

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one of said computer systems being configured to perform data I/O with said functionally coherent [The processor 240 determines monitors the cache 220 and maintains coherency for the cache 220., [0046-0047]; and distributed data storage device [a mirrored array must copy the contents of the good drive 966 over to the replacement drive 968. A striped array with parity must have the entire contents of the replacement drive 968 replaced by determining new parity information and/or replacement data calculated from parity information for all the data on the good drives, [0056]].

Per claim 26:

functionally coherent and physically distributed cache memory is operable as data cache for I/O operations with said functionally coherent and physically distributed data storage device [Coherency is when the storage subsystem manages multiple copies of storage locations in main memory or in caches to guarantee that a particular processor sees its correct value, [0050, 0056].

Per claims 27-28:

Brant inherently [a SAN environment, Brant [0055]] teaches: first set of computer systems comprises all of said computer systems; said first set of computer systems comprises a subset of said computer systems. This is because in a SAN environment (Storage Area Network) such as a peer-to-peer network system, comprising: a plurality of peer nodes coupled to a network; a subset of the plurality of peer nodes, each comprising plurality of host computers. The communications between each nodes (plural hosts) and the subset of hosts in each node are executed by a predetermined protocol [TCP/IP, UNIX] in the network.

Per claim 29:

another computer system, not belonging to said first set of computer systems, can access said functionally coherent and physically distributed data storage device [through the intermediate controller 522 according to the present invention, in the event of a failure of a host-side controller 518, 520, access to the disks on the "failed" side can be gained through the third controller 522. This greatly increases the reliability of the computer system 500, [0051]]

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Per claim 30:

functionally coherent and physically distributed data storage device is configured as a functionally coherent [0047] and physically distributed RAID storage device [0009-0013]

Per claims 31, 36:

memory portions are portions of volatile random access memories of said first set of computer systems device [In general, the intermediary storage device is **built out of RAM** to allow a quicker access time to the data, [0017]].

Per claim 32:

an information backup system [mirrored drive 716, fig. 7; [0053]] comprising:
a first set of computer systems each having means for organizing a portion of its memory as a unified multiple-computer system cache memory [Host 418, 420; Caches 430, 432, fig. 4; [0050]]; and
a second set of computer systems each having means for organizing a portion of its data storage as a unified multiple-computer-system data storage device accessible to at least some of said information network to perform I/O [RAID 312, 314, 316, fig. 1; [0048-0049]].

Per claim 33:

unified multiple-computer system cache memory comprises a portion of memory from each of said computer systems [cache 430, 432; [0050]] and said unified data storage device comprises a portion of data storage of a data storage device of at least one of said computer systems [storage devices 312, 314, 316, [0048-0049]] .

Per claim 34:

unified data storage device is configured to be accessible to at least one computer system not belonging to said second set [0051].

Per claims 35, 41:

unified data storage device is configured as a distributed RAID storage device [0008-0009].

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Per claim 37:

a method for operating an information backup system comprising:
organizing into a unified data storage device at least one data storage portion [storage devices 312, 314, 316, fig. 3] from each of a first plurality of computer systems [host 1-2, fig. 8] of said network [SAN environment, [0055]]; and
performing data I/O access to the unified data storage device using a distributed cache memory [caches 430, 432, fig. 4] that includes at least one memory portion from each of a second plurality of computer systems of said information network [0047, 0048, 0050].

Per claims 38-39, 43:

Inherently Brant [SAN environment, [0055]] teaches: defining all computer systems in said information network as said second plurality; defining said second plurality as a subset of said information network; defining said first plurality as a subset of said information network. This is because in a SAN environment (Storage Area Network) such as a peer-to-peer network system, comprising: a plurality of peer nodes [MAJOR NODES] comprising a predetermined number of host computers coupled to a network; a subset of the plurality of peer nodes [SECONDARY, THIRD NODES], each comprising plurality of host computers. The communications between each nodes [MAJOR NODE] and the subset of hosts in each peer nodes are executed by a predetermined protocol [TCP/IP, UNIX] in the network.

Per claim 40:

accessing said unified data storage device with at least one computer system that is not one of said first plurality [in the event of a failure of a host-side controller 518, 520, access to the disks on the "failed" side can be gained through the third controller 522. This greatly increases the reliability of the computer system 500, [0051]].

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Per claim 42:

volatile memories are configured as at least some of the memory portions [In general, the intermediary storage device **is built out of RAM** to allow a quicker access time to the data, [0017]].

Brant teaches the claimed limitations as mentioned above and further teaches:

Per claim 44:

a distributed cache memory [610, fig. 6] comprising a plurality of memory portions, each memory portion being a portion of a memory of a computer system among a subset of said computer systems, said memory portions being organized to function as a single coherent cache memory [0052-0053]; and
a distributed data storage device comprising a plurality of data storage portions [312, 314, 316, fig. 3], each data storage portion being a portion of storage of one or more data storage devices of a computer system among said subset of computer systems, said data storage portions being organized to function as a single data storage device, wherein said computer systems can perform data I/O with said distributed data storage device and wherein said distributed cache memory is operable as a cache memory for said distributed data storage device [0047-0048, 0050-0053].

Per claim 45:

each computer system among at least a first subset of said computer systems
having first means for performing distributed caching [caches 430, 432, fig. 4, wherein each first means provides a portion of memory from its corresponding computer system [0050], wherein all of said first means cooperate to provide a unified system cache memory from among said portions of memory [0046]; and
each computer system among said first subset further having second means for performing distributed data storage [312, 314, 316, fig. 3], wherein each second means provides a portion of data storage of a data storage device from its corresponding computer system [0048], wherein all of said second means cooperate to provide a single data storage device,

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wherein said computer systems access said single data storage device to perform I/O [0047, 0049].

Per claim 46:

each computer system among a first set of said computer systems providing a portion of its RAM memory, collectively referred to as a plurality of memory portions [In general, the intermediary storage device **is built out of RAM** to allow a quicker access time to the data, [0017]];

organizing said memory portions into a unified cache memory [caches 430, 432, (2x), fig. 4; 0050-0051];

each computer system among said first set of computer systems providing a portion or portions of one or more its data storage devices, collectively referred to as a plurality of data storage portions [storage devices 312, 314, 316, fig. 3]; and organizing said data storage portions into a single data storage device; and providing data I/O access to said single data storage device, wherein any of said plurality of computer systems can access said single data storage device 0050-0053].

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc Dinh whose telephone number is (571) 272-4191. The examiner can normally be reached on Monday-Friday 8:30 AM-5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks, can be reached on (571) 272-4201. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 746-7238 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2100.

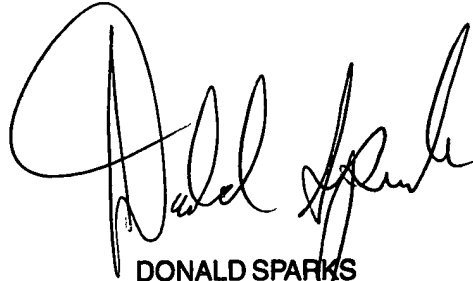


NGOC DINH

Patent Examiner

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November 14, 2005



DONALD SPARKS
SUPERVISORY PATENT EXAMINER